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THE · SOLAR · SYSTEM

AND

Marvels of the Universe.

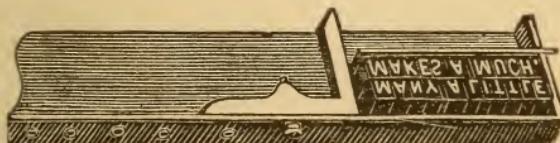
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THE SOLAR SYSTEM

AND

MARVELS OF THE UNIVERSE.

BY E. D. NIXON.



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PREFACE.

TO MY FRIENDS:

The following stanzas are a continuation of my "Astronomy in Verse." In preparing them I have consulted the best authorities and latest scientific writers. If the reader should receive some useful thought as well as pleasure from their perusal, my desire, in sending them forth, will be satisfied.

E. D. NIXON.

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THE SOLAR SYSTEM.

THE SUN.

(Weight, nearly two octillion tons.)

THE ROYAL SUN!* resplendent orb of day,
Whose central force the planets all obey,
Placed in the ocean of celestial deeps,
Within the Milky Way† his vigil keeps.
With wondrous speed‡ he sweeps along thro' space,
His orbit vast no mortal mind can trace,
But to some point in distant Hercules
His course is bent by seeming slow degrees,
Around the central sun, supposed to be
The brightest Pleiad—great Alcyone.§
Soul, light and life of every planet sphere
In his domains, revolving far or near,
He doth excel them all in massive weight
Six hundred times the system's aggregate.
These faithful worlds obey his sovereign will,
And thus the universal law fulfil.
Across his disk dark spots|| from day to day
Reveal themselves, their different shapes display ;
Fierce cyclones o'er his liquid surface sweep,
Like typhoons on the bosom of the deep.

*Thirteen hundred thousand times larger than the earth. Diameter 850,000 miles. Density one-fourth that of the earth. A pound weighs twenty-seven pounds on the sun. A stone falls towards its centre 437 feet the first second.

†The Sun belongs to the Milky Way, which is composed of suns like ours. Telescopes reveal 21,500,000 stars in the galaxy.

‡Motion in space 150,000,000 miles per year.

§Alcyone is supposed by many astronomers to be the central star around which our system is revolving.

||Some of these spots have been computed to be 186,000 miles long and to have had an area of 25 billion square miles.

MERCURY.—(*“The fleetest of the Gods,”*)

(Weight, 393 quintillion tons.)

First next the Sun, emerging from his rays,
Now Mercury* his little† spark displays.
At early morn and eve this planet bright
Throws to the earth his kiss of silver light.
His day and Earth's of equal length appear,
Three months of hers complete his fleeting year.
One hundred and five thousand miles an hour
This brilliant world controlled by solar power
Doth in his orbit move. Still, order reigns
And Nature all her creatures well sustains,
And has against the heat provision made
In mountains high‡ and valleys plunged in shade.
'Tis not the distance from the central sun
Of this near orb, nor of the furthest one,
That is alone of heat and cold the cause—
They may proceed by means of other laws:
“The substance of caloric” in the air
And on each world, in due proportion there,
“Put into action by the solar rays,”
To each the right degree of heat conveys.

*Diameter about 3,000 miles; mean distance from the Sun 35 million miles.

†It is twenty times smaller than the Earth, but one-fourth denser. Its specific gravity is about that of tin. A pound would weigh about 7 ounces, and a stone fall $7\frac{1}{2}$ feet the first second.

‡It has some lofty mountains, one being ten miles high, which is about 1-300 part of the planet's diameter.

NOTE.—“It is more probable that heat depends chiefly on the distribution of the *substance of caloric* on the surfaces and throughout the atmospheres of those bodies, in different quantities, according to the different situations which they occupy in the solar system. On this hypothesis there may be no more sensible heat experienced on the planet Mercury than on the the surface of Herschel, which is fifty times farther removed from the Sun.”—*Prof. Burritt.*

VENUS. "*The Queen of Beauty.*"

(Weight, 4 sextillion, 763 quintillion tons.)

Next coming up with easy graceful mien,
See Venus* there, the lovely peerless queen.
Thou jewel bright, thou fairest of the fair,
Thy charming smiles with rarest gems compare.
Observe her mountains looming in the sky,
From five miles ranging up to twenty high,
Her brilliant shades, her hills and valleys deep,
Her vapors dense, and clouds which o'er her sweep.
Her seasons, (each its changes frequent brings,)
Two summers, autumns, winters and two springs
Occur in quick succession on this sphere
Between her polar circles every year.†
Alternate day and night at either pole,
For sixteen weeks alternate have control.
Her atmosphere, till Science shall invent
A stronger glass, veils nature's full intent.
This sister orb how beautiful afar!
Throughout the year the morn or evening star!
Her transits‡ rare are valued by the sage
For their results, in every clime and age.

*Diameter 7,500 miles. Mean distance from the sun 66,000,000 miles. Motion in space 80,000 miles an hour.

†Its year is 32 weeks, its day is 30 minutes less than ours. Its volume is about four-fifths that of Earth, and its density about the same. A stone falls to its surface 14 feet the first second; a pound would weigh five-sixths of a pound. Its atmosphere is denser than ours and loaded with vapors.

‡Its transits are of very rare occurrence, and can happen but twice in a century. This phenomenon "may be expected to solve an important problem in astronomy—to furnish a universal standard of astronomical measure."

NOTE.—"It is known that the intermediate space between the Sun and planets is intensely cold, and heat is evolved only when the Sun's rays strike an opaque body, when the light is instantly resolved into heat. Each ray is composed of light, heat and electricity."—Dr. Kavanaugh.

THE EARTH.

(Weight, 6 sextillion tons.)

Deep in the mind of Universal Cause,
 Once Nature slept, with all her secret laws,
 But, to reveal the wonders of his might,
 The "Great I Am" now said, "Let there be light!"
 Quick through the deep abyss the fiat went,
 "And there was light," to meet Divine intent.
 Forthwith the Earth* moved in the deep of space,
 To be the home of Adam and his race.
 Observe the nature of this "*living soul*"—
 Th' immortal mind—review its secret scroll.
 Thoughts flashing on its hidden page at will
 Proclaim the acme of creative skill.
 Thus honored by her Maker's love and grace,
 Earth occupies a most exalted place.
 With rapid speed† she flies upon her course,
 Controlled by Nature's universal force.
 She varies not‡ in her diurnal rate,
 Nor lingers on the shoreless sea of fate.§
 Fair Cynthia is her faithful satellite.
 Whose silver rays imparadise the night.

* Mean distance from the Sun about 92,000,000 miles. It is 3,000,000 miles nearer the Sun in winter than in summer. Density 5½ times that of water. A stone falls 16 feet the first second.

† Motion in space 18 miles per second. Circumference of orbit nearly 600,000,000 miles.

‡ "The Earth has not varied in its revolution the 1-100 of a second in 2000 years."

§ It rushes on after the Sun, as he draws the magnificent train of all the planets with their satellites, in his immense journey through space, at the rate of more than 400,000 miles per day.

NOTE.—The atmosphere is not warmed by the direct passage of the Sun's rays, but by the reflected rays from the Earth's surface.—*Prof. Kavanaugh.*

THE MOON.

(Weight, 78 quintillion tons.)

See in the clear deep vault of evening skies
The full-orbed queen* of night in beauty rise.
High o'er the earth in her unwearied flight,
She rules supreme and charms the dreamy night.
Thirteen degrees each night she now retreats,
And thus to earth the flight of time† repeats.
No tempests o'er her peaceful breast prevail,
No clouds surround, no rains descend, nor hail ;
No air‡ conducts the symphonies of sound ;
No dew-drop bright, no rainbow there is found ;
No deep-blue skies, no twilights there appear,
Nor sunset paintings on this lonely sphere.
But there are seen outlines of sun and shade,
And regions torn and in disorder laid.
One thousand mountains ranging four miles high,
Vast plains and worn out craters meet the eye.
Although so rent and torn in times of old,
Her charms remain, her worth is yet untold,
For “precious things”§ of Earth are in her hand,
And e'en the waves obey her mild command.

*Diameter 2,160 miles. Mean distance from the Earth 238,000 miles. Its centre of gravity is supposed *not* to be at the centre of magnitude, but 33 miles beyond, and that the lighter half is towards us.

†The Metonic cycle in which there are 235 new moons, comprising 19 tropical years, after which the new moons occur at the same time they did in the previous cycle.

‡Astronomers say that if there be an atmosphere on the moon, it is on the other side which is forever turned from us.

§Deuteronomy xxxiii : 14.

MARS. "*The God of War.*"

(Weight 750 quintillion tons.)

"The martial god"**—so named by those of old,
By whom fierce wars and famines were foretold—
Describes his great ellipse around the Sun,
Beyond the Earth, wherein his journeys run.
Now fast advancing, now he will recede,
Now onward plunging, moves with rapid speed.†
Earth's day than his has forty minutes less,
His longer year by double‡ we express.
Filled with dense clouds we see his atmosphere ;§
His oceans and his continents appear.
Huge brilliant spots and zones of ice and snow
With winter come and with the summer go.
The zones and seasons of this ruddy lord
A fair resemblance to the Earth afford.
Now view his moons|| so swiftly moving there,
One farther off removed, one skims the air,
One rising westward to the eastward goes
And diverse phases frequently bestows.
So small they are they long escaped the sight,
Till Science¶ gave a stronger flood of light.

*Mean distance from the Sun, 140,000,000 miles. Its volume is one-fourth that of the Earth, but as its density is only one-half, it follows that its mass is only one-eighth of the terrestrial mass. A stone falls to its surface not quite five feet the first second. Diameter about 5000 miles.

†Motion in space 55,000 miles an hour.

‡Its year is 687 of Earth's days. §Atmosphere and clouds like ours. ||It has two moons, the outer one is distant 12,300 miles and revolves about the planet in 30 hours, 18 minutes; the inner one 3,600 miles distant and revolves about him in 7 h. 40 m., going through its various phases about twice each night.

¶Discovered Aug. 1877, by Prof. Hall, Nav. Obsv. Wash'n, D. C.

NOTE.—The inner moon moves so much faster than the planet revolves, that it would have this motion to an inhabitant of Mars.

THE ASTEROIDS.

A mighty archipelago between
The orbits great of Mars and Jove is seen.
By leaps upon revolving grains of light—
(The Asteroids in their eccentric flight
In quick succession, in their orbits vast)—
Is this great zone, this *break* in nature passed.
Here fancy halts, and with amazement fraught,
Gives way and leaves the theme to solemn thought.
O wondrous scene ! this break in nature's chain !
But yet the link in fragments doth remain :
Behold the largest of these planets there,
Ceres and Pallas, Juno, Vesta fair—
The last alone delights the naked eye,
The other three by telescope we spy,
Now sweep the gulf and scan from shore to shore,
View shining there two hundred* fragments more.
Still more than these there are in atoms bright,
To gild the scene and beautify the night.
Observe the law : the ratio *two* is found†
From Mercury to Neptune's distant round.

*220 of these planetoids have been discovered, "ranging from 600 miles in diameter down to so small a body that a good walker could easily make the tour of one in a day." Some astronomers say there may be as many as 150,000 of them.

†"The scientific Bode entertained the opinion that the planetary distances above Mercury formed a geometrical series, each exterior orbit being double the distance of its next interior one from the Sun. But this law seemed to be interrupted between Mars and Jupiter. Hence he inferred that that there was a planet wanting in that interval; which is now happily supplied by the discovery of the four star-formed planets."

THE ASTEROIDS. (Continued.)

But in *this* space, within these broad domains,
The “ratio two” is lost and *four* obtains.
Here once a mighty world of light was placed,
It is believed, as in these fragments traced.
Alas, its fate! Mayhap that brilliant world
Was from its throne celestial sudden hurled,
And at its strong convulsions and its death
Creation mourned and nature held her breath.
Volcanoes belched forth streams of liquid fire,
Its hemispheres and continents entire
Were broken up and rounded into spheres,
And each in its own orbit now appears.*
Its requiem is sung; no more again
Will it upon its circling course be seen
As one of nature’s golden links of light
Drawn out beneath the jeweled deep of night.
Thus, one by one, may each bright world sublime
Pass thro’ the portals of expiring time;
For planets die, and systems, too, are spent,†
And all creation moves to this event.

*They all revolve around the Sun in regular orbits, comprising a zone of about 100,000,000 miles in width. A pound would weigh two ounces on our Moon, while on Vesta a man could easily spring sixty feet in the air and sustain no damage.

†**NOTE.**—Rev. Prof. Vince, one of the most learned and pious astronomers of the age, makes this remark: “The disappearance of some stars may be the destruction of that system at the time appointed by the Deity for the probation of its inhabitants; and the appearance of new stars may be the formation of new systems for new races of beings then called into existence to adore the works of their Creator.” The late eminent Dr. Good also observed that “worlds and systems of worlds are not only perpetually creating, but also perpetually disappearing. Within the period of the last century, not less than thirteen stars, in different constellations, seem to have perished, and ten new ones to have been created.”

JUPITER. "*The king of the Gods.*"

(Weight 1 septillion, 826 sextillion tons.)

O Jove!* adorned with pearly islands† 'round,
Thou dost in beauty's richest hues abound,
And as a full-orbed gem of rarest light
Thou wearest well the honors of the night.
Thy many belts, which change from time to time,
Dark streaks and bright, reveal a wondrous clime.
Four satellites attend this royal lord,
And richest beauties in their flights afford.
Two have a bluish tint uniquely made,
And one a reddish, one a yellow shade,
One near, two far, and one still farther viewed,
And each reveals a different magnitude.
Their revolutions fitly represent
The solar system in minute extent.
Why this display of wisdom and design‡—
This wise prevision of th' Eternal Mind,
Along this line of beauty 'neath his feet,
So rich, enchanting, lovely and complete?
Trace thou the links between effects and cause,
And see His hand in Nature's secret laws.

*Mean distance from the Sun 475 million miles, motion in space 30,000 miles an hour. Size 1400 times larger than the earth. Its day is about ten hours long, its year equal to twelve of ours. It is one-fifth as dense as the earth. Its rotation at the equator 467 miles per minute. A stone would fall 39 feet the first second.

†His four moons. "All the starry exhibition sweeps through his sky in five hours."

‡Under the telescope Jupiter presents a beautiful Copernican system in miniature.

SATURN. "*The God of Time.*"

(Weight 546 sextillion, 406 quintillion tons.)

See Saturn* now and view his three-fold ring—
 A brilliant zone around this mighty king,
 Reflecting splendor on the smiling night,
 Surrounds the orb and multiplies its light.
 His surface shows a state diversified,
 Dark spots and belts appear on every side.
 Behold his moons—eight bright and lovely queens
 Bestow their charms and yield the fairest scenes :
 Their blending glories bursting on the sight
 Inspire the mind with wonder and delight.
 The great Omniscient One is everywhere,
 To chant his praise behold his works are there ;
 Intelligence, submissive to his will,
 His greatest work, reveals his greatest skill.
 Does He to Earth, the merest mote, confine
 This vital spark, the intellect divine,
 Whilst that resplendent orb and billions more
 No beings have to worship and adore
 Th' Omnipotent who holds them in his hand,
 And wheels them on to do his great command ?

*Mean distance from the Sun 872,000,000 miles. Motion in space, 21,000 miles per hour. Day 10½ hours long. Year equal to 30 of our years. Size 750 times larger than the Earth. Its seasons are like ours, only they are seven years long. Its density is about that of pine wood ; gravitation about the same as ours.

NOTE.—The measurement of Saturn's rings is as follows : the exterior, diameter 173,000 miles, breadth 10,000 ; middle 150,000 miles, breadth 18,300 ; distance between 1,750 miles ; interior ring, diameter 113,400 miles, breadth 9,000 ; distance of int. ring from planet 10,500 miles. Breadth of ring system 39,050 miles. Thickness of rings 100 miles. Diameter of system about 4,500,000 miles.

URANUS. "*The most ancient of the Gods.*"

(Weight 76 sextillion, 721 quintillion tons.)

Deep in the bosom of the silent night,
Almost beyond the reach of human sight,
A wondrous orb* with pale blue light is found,
In easy motion on his ample round.
The telescope no ring or zone reveals,
All spots or belts his distance great conceals;
The movement on his axis is unknown,
We can discern his yearly time alone.
On this great world no clouds, no atmosphere,
No seasons or vicissitudes appear.
View next his moonst†—that *greenish* retinue—
Six curious orbs which much enhance the view,
Revolving 'round him in a backward way,
Their diverse phases frequently display.
Thus moving westward, now in retrograde,
Show nature has an odd departure made.
Astronomers can not the reason tell,
But those who in that distant region dwell
May understand by wisdom's greater light;
And be assured that Nature's laws are right.

*Mean distance from the Sun about 1,800 million miles. Motion in space 15,000 miles an hour. Its year is equal to 84 of our years. It is 72 times larger than the earth. It is lighter than water, having a density about equal to ice. Since its axis lies in the plane of its orbit, the Sun winds in a spiral form around the whole planet.

†Their orbits are nearly perpendicular to the plane of the planet's orbit, and their movements are retrograde, that is, in the same direction as the hands of a watch.

NEPTUNE. "*The God of the Sea.*"

Now last of all, see Neptune* in his course,
 With lazy motion† and with feeble force,
 Creep on amid the constellations fair,
 And hold the limit of our system there.
 Although so far removed it doth obey
 The Sun, three thousand million miles away.
 Its people have less brilliant scenes than we,
 No larger worlds, no grander systems see,
 And on the confines of our system great
 See less of their Creator's vast estate.‡
 This world, placed in the starry deep of night,
 Has but one moon, one faithful satellite,
 Whose motion swift completes within six days
 Its ample round and every different phase.
 Far as the Sun's magnetic force extends,
 All life on his electric ray depends.||
 Though other worlds§ have each a different race,
 Yet God decrees and nature fits the place.
 Not *man alone* may songs of worship raise—
 A *peopled Universe* may chant His praise !

*Mean distance from the Sun 2,750 million miles.

†Motion in space 12,000 miles an hour. Size 100 times larger than the Earth, but invisible to the naked eye. Its year is equal to 164 of ours. Density about same as Uranus. ‡The planets are too near the Sun to be seen from him, except Saturn and Uranus. The Milky Way is no nearer to his view, the fixed stars shine no more brightly. His moon revolves at about the same distance as ours.

||NOTE.—The Sun alone is the source of *positive* electricity—negative electricity or magnetism resides with the earth and other planets. The Sun is placed in the heavens as a great factor to receive and dispense the boundless floods of electricity with which God has filled universal space."—Prof. Kavanaugh, M. D.

‡The planets of other systems.

MARVELS OF THE UNIVERSE.

COLORED, DOUBLE AND MULTIPLE SUNS.

THE solar systems, with their shining hosts
Of planet worlds, at their appointed posts,
The constellations of refulgent suns
Of varied hues, (each system different runs,)
As “rainbow flowers of the footstool” shine,
And all proclaim their authorship divine.
Suns white and red, blue, yellow, orange, green,
And every blooming tint may there be seen ;
Like jewels rare or India’s precious stone,
They flash in splendor ’round their Maker’s throne.*
Suns double, triple and quadruple rise,
And suns septuple blaze along the skies.
About one common centre they rotate
And orbits small involve or orbits great.
Some have a period of one hundred years,
And some a thousand th’ estimate appears ;
And some there are whose cycles are unknown
Except to the Omniscient Mind alone.
Vast roll of worlds ! which we may rightly scan
For beings pure, ethereal, angel, man.

NOTE.—Sirius is white, Antares red, Capella yellow, Lyra blue, and Castor green. In the pure, transparent atmosphere of tropical regions their colors are far more brilliant. Prof. Steele says: “Over 650 of the double stars have been found to be connected *physically*. Each double star of this class forms a binary system of two suns revolving in an elliptical orbit about their common centre of gravity like the planets of our system, in accordance with Newton’s law of gravitation. Thus E Lyrae is a double-double star and Theta Orionis is a system of seven suns.”

STAR CLUSTERS.

The Pleiades first on the list we name,
Called "Seven Stars"—a group of sacred fame.
Two hundred stars of varying magnitude
This group contains, through largest glasses viewed.
Next Coma Berenice's glittering maze
Of beauteous hair her silver light displays.
In Cancer's crest, the Beehive of the sky
By close observance meets the naked eye.
Brave Perseus, who won the lovely maid,
Reveals a group near his victorious blade;
The blending beauties of their varied hues
Yield to the vision most exquisite views.
Whatever be their nature or design,
As suns they glow and with effulgence shine:
They constitute a family alone,
Controlled by laws internally their own.
Some groups contain ten thousand worlds of light—
Controlling centres of magnetic might—
And 'round them move in heaven's unending deep
Grand solar systems with majestic sweep.

NOTE.—In the Southern sky are clusters still more remarkable. In the Cross is a group of 110 stars of various colors, so that looking on it, says Herschel, "is like gazing into a casket of precious gems." He also remarks, "It would be a vain task to attempt to count the stars in one of these globular clusters. They are not to be reckoned by hundreds, for it would appear that many clusters of this description must contain ten or twenty thousand stars, compacted and wedged together in a round space apparently not more than a tenth part as large as that which is covered by the moon."

NEBULÆ. "THE MILKY WAY."

Those objects in the dreamy deep of space
Which we with naked vision dimly trace,
By telescopes are rounded into spheres
Till each like stars or groups of stars appears.
Some still remain as phosphorescent light,
Defying all inventions of the sight.
Two thousand and five hundred nebulae
Of different shapes and sizes one may see.
Some would the orbit of Uranus fill,
Some distant Neptune's; some are larger still.
One in the handle of Orion's blade,
"Like wisps of cloud," of "flocky masses" made,
Gives glimpses of (through intervals between,
As windows open) regions yet unseen.
The Milky Way in its extended stream
Of radiant worlds unfolds a wondrous theme,
Where each dim star may be a central sun
Sustaining some great system of its own.
In this faint stream *our* system takes its course
In its grand orbit 'round its central force.

NOTE.—Nebulae are observed in many forms, the elliptic being the most common. "The great nebula in Andromeda was discovered a thousand years ago and is visible to the naked eye; 1,500 stars have been noted distinctly in its mazes by the telescope, but it is calculated to contain millions. A ray of light from our Sun would take 800,000 years to reach it! These figures teach us something of the limitless expanse of that space in which God is working the mysterious problem of Creation."—*Steele*.

PRESENT CREATION AND DESTRUCTION OF STARRY SYSTEMS.

Not these are all which meet the naked eye,
Nor those which largest glasses multiply,
For untold millions in God's wide domains
His eye beholds, his mighty word ordains.
Nor ends his might, nor yet his glories end—
Still systems new and worlds o'er worlds ascend,
And universe on universe may rise
And new created glories fill new skies.
As in the days of fair Creation's dawn,
He fashioned worlds, established eve and morn,
And fixed the times and seasons of the Sun,
Its planets gave, the courses they must run,
So now may worlds by his supreme command,
Begin their course, directed by his hand.
His presence there in grandeur still appears
In conflagrations of celestial spheres.
Worlds flare and flash, burst into flames and burn,
Go out in darkness and no more return.
These systems end, their destined course is run,
Their planets die with each expiring sun.

NOTE.—Prof. Steele says, "The investigations by spectrum analysis indicate that the star of 1866 consisted of burning hydrogen gas. We can suppose this was evolved by some convulsion, and taking fire, wrapped in flames the entire globe. This need not involve the idea of destruction, but only a change of form. In this way a dark star may become luminous or a bright one may be extinguished. Thus it appears that the process of creation and destruction is going on in the heavens now."

OUR SYSTEM TO BE DESTROYED.

Those worlds destroyed at the appointed date
By Deity, he may anew create,
Or plant new systems in their vacant place,
Which as new stars the scientist may trace.
Shall such destruction, such catastrophes,
Such conflagrations dread as ruined these,
Befall the Earth, its beauties all consume,
Involve the Sun and planets all in gloom?
The solemn text is written in the skies,
And Holy Writ the strongest proof supplies.
'Tis felt on Earth and seen on nature's page,
And hoary Time points to th' expiring age.

To the great Author of Creation's plan,
Who made the world and, in his image, Man,
Let praise ascend from all beneath the skies,
And nature's universal anthem rise.

Teach me, O Lord, aright thy works to view,
With light and truth my darkened mind endue;
Lift up my soul in higher walks to move.
And touch my heart with thy redeeming love!

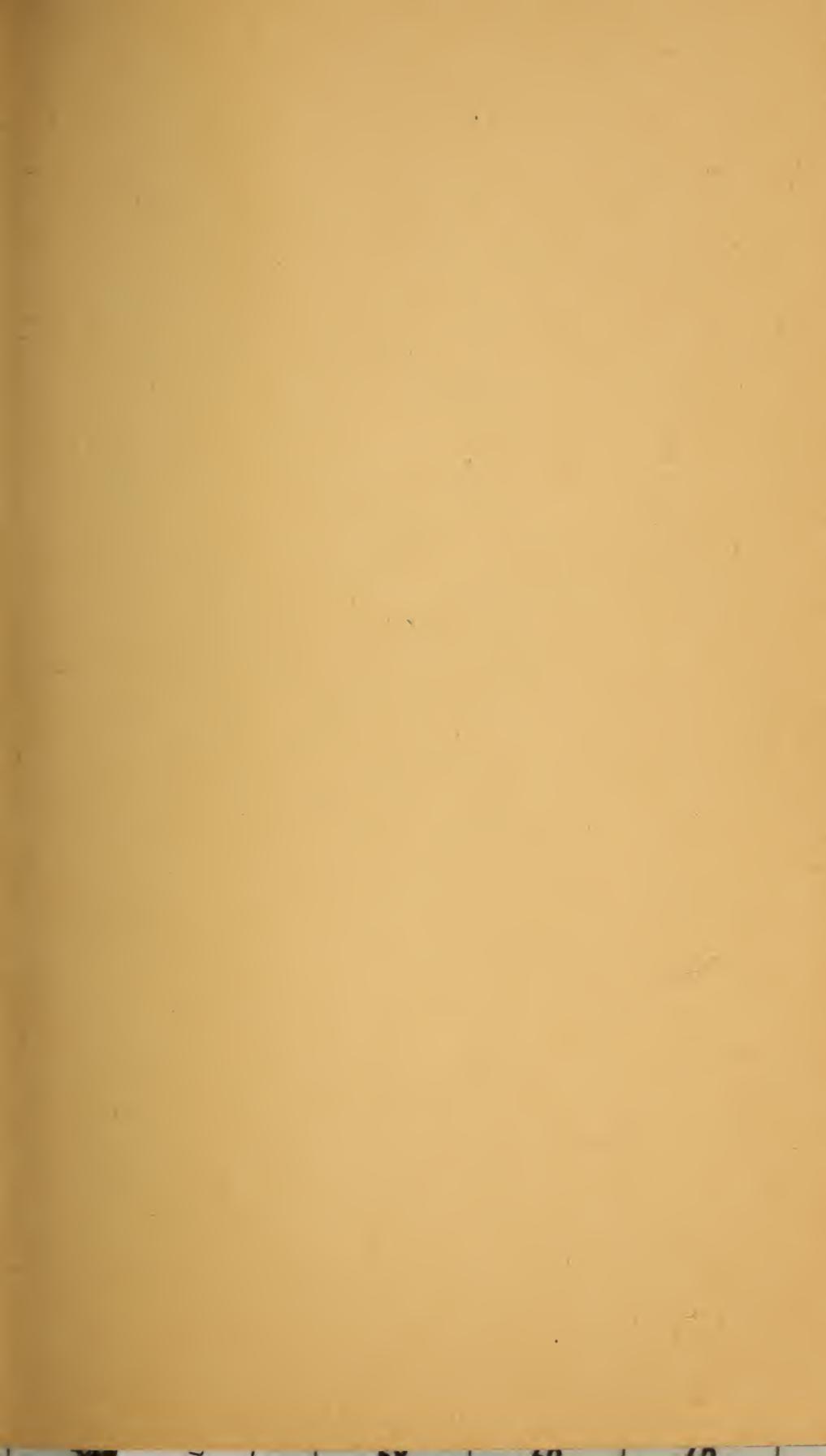
NOTE.—“But the day of the Lord will come as a thief in the night; in which the heavens shall pass away with a great noise, and the elements shall melt with fervent heat, the earth also and the works that are therein shall be burned up. Nevertheless we, according to his promise, look for a new heavens and a new earth, wherein dwelleth righteousness.”—II Peter iii: 10-13, 7, 12.

“And I saw a new heaven and a new earth; for the first heaven and the first earth were passed away; and there was no more sea.”—Rev. xxi; 1, also x: 5, 6.



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